

What is claimed is:

1. A manufacturing method of a flat panel display,  
comprising:

5 joining a substrate, which has an electron emitting element,  
and a faceplate, which has a phosphor screen, so that the electron  
emitting element and the phosphor screen face to each other with  
a gap; and

irradiating electrons onto at least one of the substrate  
and the faceplate, in a vacuum atmosphere.

10 2. A manufacturing method of a flat panel display as set  
forth in claim 1,

wherein the irradiating of electrons has accommodating at  
least one of the substrate and the faceplate in a treatment vessel,  
and irradiating the electrons onto at least one of the substrate  
15 and the faceplate accommodated in the treatment vessel from one  
or more electron sources disposed therein.

3. A manufacturing method of a flat panel display as set  
forth in claim 2,

20 wherein the electrons are irradiated alternately or  
simultaneously from two or more electron sources, which are  
disposed in the treatment vessel in the irradiating of electrons.

4. A manufacturing method of a flat panel display as set  
forth in claim 2,

25 wherein the electrons emitted from the electron source are  
irradiated, while being deflected, in the irradiating of  
electrons.

5. A manufacturing method of a flat panel display as set  
forth in claim 2,

wherein the electrons emitted from a planar type of the electron source are irradiated in the irradiating of electrons.

6. A manufacturing method of a flat panel display as set forth in claim 1,

5        wherein the electrons are irradiated in a vacuum atmosphere of which degree of vacuum is maintained at  $10^{-3}$  Torr or less in the irradiating of electrons.

7. A manufacturing method of a flat panel display as set forth in claim 1,

10        wherein the electrons are irradiated while heating at least one of the substrate and the faceplate in the irradiating of electrons.

8. A manufacturing method of a flat panel display as set forth in claim 7,

15        wherein at least one of the substrate and the faceplate is heated at a temperature in the range from 200 to 400°C in the irradiating of electrons.

9. A manufacturing method of a flat panel display as set forth in claim 7,

20        wherein, after the electrons are irradiated onto at least one of the substrate and the faceplate, an irradiated object is cooled to a temperature of 100°C or less.

10. A manufacturing method of a flat panel display as set forth in claim 1,

25        wherein the substrate and the faceplate are joined through a supporting frame in a vacuum atmosphere after the electrons are irradiated onto at least one of them.

11. A manufacturing method of a flat panel display as set

forth in claim 10,

wherein the supporting frame is irradiated with electrons in the irradiating of electrons.

12. A manufacturing method of a flat panel display as set  
5 forth in claim 1,

wherein the irradiating of the substrate and the irradiating of the faceplate are carried out in the same treatment vessel.

13. Manufacturing equipment of a flat panel display,  
10 comprising:

a treatment vessel in which at least one of a substrate, which has an electron emitting element, and a faceplate, which has a phosphor screen, is accommodated;

transferring means for sending at least one of the substrate  
15 and the faceplate in and out of the treatment vessel;

exhausting means for evacuating the inside of the treatment vessel to a vacuum atmosphere;

irradiating means for irradiating an electron beam onto at least one of the substrate and the faceplate, which are  
20 accommodated in the treatment vessel; and

joining means for joining the substrate and the faceplate, at least one of which is irradiated with the electron beam, while arranging so as for the electron emitting element and the phosphor screen to face to each other with a gap.

25 14. Manufacturing equipment of a flat panel display as set forth in claim 13, further comprising:

means for heating at least one of the substrate and the faceplate, which are accommodated in the treatment vessel.